Operating Instructions

for use by heating contractor

Vitocrossal 200
CM2 Series 400, 500, 620 and 620 TX
Gas condensing boiler with cylinder burner

Heating input: 1445 to 2245 MBH
423 to 658 kW

VITOCROSSAL 200

WARNING

If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

Do not store or use gasoline or other flammable liquids in the vicinity of this or any other appliance.

WHAT TO DO IF YOU SMELL GAS

- **Do not try to light any appliances.**
- **Do not touch any electrical switches, do not use any phone in your building.**
- **Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.**
- **If you cannot reach your gas supplier, call the fire department.**

Installation and service must be performed by a qualified installer, service agency or the gas supplier.

WARNING

Improper installation, adjustment, and/ or operation could cause carbon monoxide poisoning resulting in injury or loss of life.

This product must be installed and serviced by a professional service technician who is experienced and qualified in hot water boiler installation and gas/oil combustion.

Product may not be exactly as illustrated.

IMPORTANT

Read and save these instructions for future reference.

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Please file in Service Binder

Safety, Installation and Warranty Requirements

Please ensure that these instructions are read and understood before commencing installation. Failure to comply with the instructions listed below and details printed in this manual can cause product/property damage, severe personal injury, and/or loss of life. Ensure all requirements below are understood and fulfilled (including detailed information found in manual subsections).

- **Product documentation**
  Read all applicable documentation before commencing installation. Store documentation near boiler in a readily accessible location for reference in the future by service personnel.

  ▶*For a listing of applicable literature, please see section entitled "Important Regulatory and Safety Requirements".*

- **Warranty**
  Information contained in this and related product documentation must be read and followed. Failure to do so renders the warranty null and void.

- **Licensed professional heating contractor**
  The installation, adjustment, service and maintenance of this equipment must be performed by a licensed professional heating contractor.

  ▶*Please see section entitled "Important Regulatory and Installation Requirements".*

- **Contaminated air**
  Air contaminated by chemicals can cause by-products in the combustion process, which are poisonous to inhabitants and destructive to Viessmann equipment.

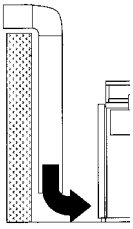
  ▶*For a listing of chemicals which cannot be stored in or near the boiler room, please see subsection entitled "Mechanical Room".*

- **Advice to owner**
  Once the installation work is complete, the heating contractor must familiarize the system operator/ ultimate owner with all equipment, as well as safety precautions/requirements, shutdown procedure, and the need for professional service annually before the heating season begins.

- **Carbon monoxide**
  Improper installation, adjustment, service and/or maintenance can cause flue products to flow into living space. Flue products contain poisonous carbon monoxide gas.

  ▶*For information pertaining to the proper installation, adjustment, service and maintenance of this equipment to avoid formation of carbon monoxide, please see sections entitled "Mechanical Room" and "Venting Connection" in the Installation Instructions.*

- **Fresh air**
  This equipment requires fresh air for safe operation and must be installed ensuring provisions for adequate combustion and ventilation air exist.

  ▶*For information pertaining to the fresh air requirements of this product, please see subsection entitled "Mechanical Room".*

- **Equipment venting**
  Never operate boiler without an installed venting system. An improper venting system can cause carbon monoxide poisoning.

  ▶*For information pertaining to venting and chimney requirements, please see section entitled "Venting Connection". All products of combustion must be safely vented to the outdoors.*

⚠ WARNING

Installers must follow local regulations with respect to installation of carbon monoxide detectors. Follow the Viessmann maintenance schedule of the boiler contained in "Service Instructions".

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About these Instructions

Take note of all symbols and notations intended to draw attention to potential hazards or important product information. These include "WARNING", "CAUTION", and "IMPORTANT". See below.

WARNING

Indicates an imminently hazardous situation which, if not avoided, could result in death, serious injury or substantial product/property damage.

▶*Warnings draw your attention to the presence of potential hazards or important product information.*

CAUTION

Indicates an imminently hazardous situation which, if not avoided, may result in minor injury or product/ property damage.

▶*Cautions draw your attention to the presence of potential hazards or important product information.*

IMPORTANT

▶*Helpful hints for installation, operation or maintenance which pertain to the product.*

▶

▶*This symbol indicates that additional, pertinent information is to be found.*

▶*This symbol indicates that other instructions must be referenced.*

For your Safety

■ **Operation**

Before operating the boiler, make sure you fully understand its method of operation. Your heating contractor should always perform the initial start-up and explain the system. Any warranty is null and void if these instructions are not followed.

■ **Gas smell**

Follow the instructions on the front of the manual.

■ **Flue gas smell**

- Deactivate heating equipment.
- Open windows and doors.
- Inform your heating contractor immediately.

CAUTION

Incomplete combustion and poisonous gases result if the fresh air intakes in the mechanical room are closed. Never close these openings.

For your Safety *(continued)*

■ **Working on the equipment**

All personnel working on the equipment or the heating system must have the proper qualifications and hold all necessary licenses.

Ensure main power to equipment, heating system, and all external controls have been deactivated. Close main gas supply valve. Take precautions in all instances to avoid accidental activation of power during service work.

■ **Combustion air and ventilation openings**

Ensure that combustion air openings and ventilation air openings in the mechanical room are open.

■ **Carbon monoxide**

The U.S. Consumer Product Safety Commission strongly recommends the installation of carbon monoxide detectors in buildings in which gas-burning equipment is installed. Carbon monoxide (CO) is a colorless, odorless gas, which may be produced during incomplete combustion of fuel and/or when the flame does not receive an adequate supply of combustion air.

Carbon monoxide can cause severe personal injury or loss of life.

Therefore, carbon monoxide detectors that are in compliance with a nationally recognized standard (e.g. ANSI/UL 2034-2002, CSA 6.19-01) should be installed and maintained in buildings that contain gas-burning equipment.

Note: Viessmann does not test any detectors and makes no representation regarding any brand or type of detector.

■ **Dangerous conditions**

- Deactivate main power immediately
- Close gas supply valve

IMPORTANT

Keep all literature in a safe place at the installation site. Contact Viessmann for additional copies.

■ **Frozen water pipe hazard**

⚠ WARNING

Failure to protect against frozen pipes could result in burst water pipes, serious property damage and/or personal injury. Boiler may shut down. Do not leave your home unattended for long periods of time during freezing weather conditions without turning off the water supply and draining water pipes or otherwise protecting against the risk of frozen pipes.

Your heating boiler is designed to provide a warm and comfortable living environment. It is NOT designed to ensure against freezing of water pipes.
The boiler is equipped with several safety devices that are designed to shut down the boiler and to prevent it from restarting in the event of various unsafe conditions.

If your boiler remains off for an extended period of time during cold weather, water pipes may freeze and burst, resulting in extensive water damage and conditions in which mold could grow. Certain molds are known to cause respiratory problems, as well as to pose other serious health risks. In case of water damage, immediate measures should be taken to dry out affected areas as quickly as possible to prevent mold from developing.

If your home will be unattended for an extended period of time during cold weather, you should...

- Shut off the water supply to the building, drain the water pipes and add an antifreeze for potable water to drain traps and toilet tanks. Open faucets where appropriate.

Or...

- Have someone check the building frequently during cold weather and call a qualified service agency if required.

Or...

- Install a reliable remote temperature sensor that will notify somebody of freezing conditions within the home.

For your Safety *(continued)*

■ **Maintenance and cleaning**

Regular inspection and service by a qualified heating contractor is important to the performance of the Viessmann CM2 boilers. Neglected maintenance impacts on warranty; regular inspection ensures clean, environmentally friendly and efficient operation. We recommend a maintenance contract with a qualified heating contractor.

■ **Regular maintenance and service**

The entire heating system must be cleaned and serviced on a regular basis by a qualified heating contractor or service agency to ensure reliable, energy-efficient, and environmentally friendly operation.

The build-up of soot on the heat exchanger raises the flue gas temperature and reduces efficiency.

Indirect-fired domestic hot water storage tanks (if installed) should be serviced within two years (at most) of the installation date, and regularly thereafter.

For an overview of scheduled service procedures, please see section entitled “Service Schedule” on page 10 of this manual.

The owner or dedicated personnel should perform the checks outlined in the Service Schedule to ensure proper operation of the heating system.

⚠ WARNING

The boiler must not be located in areas or rooms where chemicals are stored, or aggressive vapors from (i.e. bleach, hair spray, methyl chloride, carbon tetrachloride or perchloroethylene) or high dust levels or humidity levels are present. Heat exchanger corrosion might occur and reduce the lifetime of the boiler significantly. If above criteria are not properly observed and boiler damage results, any warranty on the complete boiler and related components will be null and void.

IMPORTANT

Keep boiler and boiler room clear and free from combustible materials, gasoline and other flammable vapors and liquids. Do not obstruct the flow of combustion and ventilation air. All inspection, maintenance and service must be performed by a qualified heating contractor.

⚠ WARNING

Improper installation, adjustment, service, or maintenance can cause flue products to flow into living space. Flue products contain poisonous carbon monoxide gas which can cause nausea or asphyxiation resulting in severe personal injury or loss of life.

⚠ WARNING

As there are no user-serviceable parts on the boiler, burners or control, the end-user must not perform service activities of any kind on system components. Failure to heed this warning can cause property damage, severe personal injury, or loss of life.

⚠ WARNING

Do not use this boiler if any part has been under, or exposed to water. Immediately call a qualified heating contractor to inspect the boiler and to replace any part of the control system and any gas control which has been under, or exposed to, water.

■ **Technical information**

Literature applicable to the Vitocrossal 200, CM2 boiler:
- Installation Instructions
- Service Instructions
- Operating Instructions
- Combustion air intake adaptor Installation Instructions

IMPORTANT

Keep all literature in a safe place at the installation site. Contact Viessmann for additional copies.

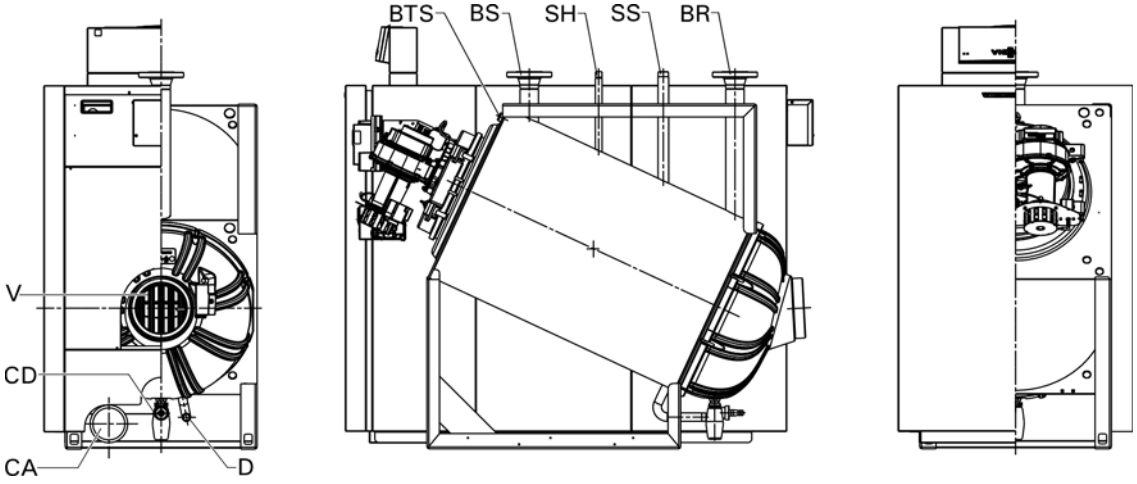
Description

The Viessmann Vitocrossal 200, CM2 boiler series is CSA certified for Canada, is constructed in compliance with CSA B51 Standard and carries Canadian Registration Numbers.

The boiler is suitable for a maximum operating pressure of 75 psig and a maximum boiler water temperature of 210° F (99° C).

The Vitocrossal 200 boiler must only be installed in closed loop hot water heating systems using a pre-charged membrane expansion tank.

The proper burner size must be verified and the burner must be adjusted so that the maximum input of the appropriate boiler size is always observed and adjusted. The gas burner must be installed according to the instructions supplied by the burner manufacturer.



Legend

V	Vent pipe connection
D	Drain
CD	Condensate drain
BR	Boiler return
BTS	Boiler water temperature sensor
BS	Boiler supply
SH	Female connection NPT ½ in. for pressure gauge
CA	Combustion air pipe connection
SS	Safety supply; pressure relief valve, air vent, low water cut-off

Description *(continued)*

Fuel(s)

Natural gas or liquid propane gas.

Boiler control

The Vitocrossal 200 boiler series is operated with a Vitotronic control and microcomputer indoor/outdoor control system for boiler operation without low temperature limit. The control system must be programmed for this type of operation by the installer.

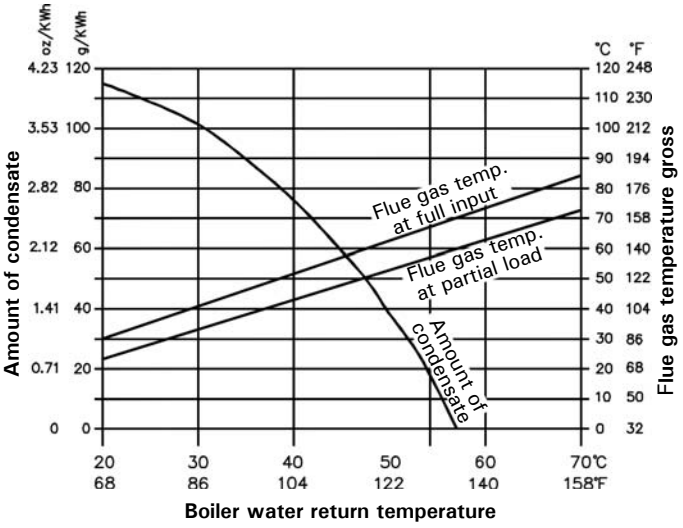
Control instructions supplied with boiler control.

Condensate disposal

During the operation of the Vitocrossal 200 boiler, the amount of condensate as per the diagram can be expected.

The values given are approximate amounts occurring under practical conditions. Not included in the chart is the amount of condensate occurring in the vent pipe and chimney system. The condensate from the chimney system can be collected together with the condensate from the heating boiler and be disposed of into a floor drain.

The condensate occurring will have a pH value between 3 and 4. If local building requirements demand neutralizing the condensate before disposal, contact Viessmann Manufacturing Company Inc. for a correctly sized neutralization tank. The treated condensate will show pH values of between 6.5 and 9 and can then be disposed of into the waste water system.



Vitocrossal 200 boiler efficiency dependent on system heating water return temperatures and load conditions

Boiler location

The boiler must not be installed in rooms or areas where halogenated hydrocarbons are present in the combustion air, such as barber shops and beauty salons, printing shops, chemical cleaners, laboratories etc.

CAUTION

The boiler room must be safe from frost and be properly ventilated.

Venting connection

A large amount of water vapor contained in the flue gases of condensing boilers condenses. The condensate pH value is between 3 and 5.5. The flue gas temperatures depending on the boiler water temperature may be between 77° F (25° C) and 257° F (125° C).

The manufacturer of the chimney system or venting system has to properly design the venting system as well as select proper materials.

If there are any questions in regards to the neutralization of the condensate and/or to the venting of this boiler series, contact your local Viessmann Sales Representative.

Optimum operation

To ensure optimum operation of your heating system do the following:

- Keep the boiler and the boiler room clean and free of dust and dirt.
- Ensure proper and adequate system pressure by occasionally checking the pressure gage.
- Have a qualified heating contractor service and maintain your heating system on a regular basis. See Service Schedule starting on page 10 for details.

Operation

Ⓐ ON indicator (green)
Ⓑ Fault indicator (red)
Ⓒ Emissions test switch (only for service purposes)
Ⓓ ON/OFF switch
Ⓔ MCB/fuses

Starting the heating system

Ask your heating contractor about the following:
- Boiler and relevant control unit type
- Level of the required system pressure
- Position of the pressure gauge, shutoff valve, gas shut-off valve, ventilation apertures

1. Check the heating system pressure at the pressure gauge. If the pressure of the heating system is too low, top up the water or notify your heating contractor.
2. Open the gas shut-off valve.
3. Switch ON the power supply, e.g. at a separate MCB/ fuse or a mains isolator.
4. Switch the ON/OFF switch ON (see diagram). After a short time, the standard menu is displayed (see page 13) and the green ON indicator illuminates. Your heating system and, if installed, your remote controls are now ready for use.

Separate heating system controls

In case additional controls are installed in the boiler room, e.g. control aquastats, mixing valves, controls etc., please observe their respective operating instructions.

Domestic hot water production

The Vitocrossal 200 boiler may be used to supply domestic hot water heating by means of an indirect-fired hot water storage tank. The appropriate connections to the boiler must be made, as well as the correct size circulating pump must be used. The control circuit to provide domestic hot water is already provided within the Vitotronic control.

System shut-down

The boiler controls monitor the operation of your heating system in conjunction with installed system controls (if applicable) based upon indoor/outdoor control, setback programming and other settings. Please refer to the respective documentation of the boiler controls, or other system controls, to make adjustments.

Deactivate main power switch and all additional switches controlling additional pumps or controls, including main switch for burner. Close all valves in the system.

IMPORTANT

Read the operating instructions supplied with the Vitotronic control, as well as Operating Instructions of the gas burner before deactivating or activating the heating system.

Service Schedule

The following is an overview of scheduled service steps.
Regular service work ensures reliable, energy-efficient, and environmentally friendly operation.

Frequency	Performed by	✓	Service
Monthly	Owner / Operator		Check the system pressure frequently.
			Ensure proper operation of the boiler control.
			Inspect all seals; retighten or replace as necessary.
			Ensure an adequate supply of combustion air/ventilation air into and out of the mechanical room is maintained.
			Ensure that nothing obstructs the flow of combustion - ventilation air, and no chemicals, garbage, gasoline, combustible materials, flammable vapors, or liquids are stored, not even temporarily, in the vicinity of the boiler.
			Check for water on the floor from the discharge pipe of pressure relief valve or any other pipe, pipe joint, valve, or air vent.
			Test pressure relief valve and check for proper operation.
			Check all operational high limits for proper operation.
			Check for proper operation of the condensate neutralization system (if used).
			Test pressure relief valve and check function.
			Check the condition and fill status of the neutralization media.
			Check the pH value of the flue gas condensate.
			Check for moisture/water on vent pipe joints and appearance of ice on the vent pipe or chimney outlet in the winter time.
Annually	Owner / Operator		Ensure service work/test is conducted at least annually by a qualified heating contractor, and that any deficiencies are corrected immediately.
	Heating Contractor		Test functionality of safety high limits.
			Test burner with burner accessories according to the corresponding maintenance checklist.
			Test and establish proper chemical makeup of system water.
			Check flue pipe condition, chimney connection and chimney itself.
			Check pressure relief valve and system pressure, and verify proper operation.
			Check heating pipe joints, valves, air vents, etc. System leaks must be corrected immediately to avoid further defects. The cause of defect must also be determined in order to avoid further problems.
			Check for proper combustion air supply and ventilation of boiler / mechanical room.
			Check for combustible materials or chemicals stored too close to the boiler.
			Test high limits by dialing lower settings, switching burner on/off. If low water cut-off is installed, check and verify proper function according to manufacturer's instructions.

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Service Schedule *(continued)*

Frequency	Performed by	✓	Service
Annually	Heating Contractor		When circulating pump is field-installed or existing, check requirements for maintenance or lubrication according to manufacturer's specifications.
			Check for gas-tight connection of gas piping, unions, gas valve and manifold.
			Check proper ignition and gas burner operation.
			Combustion test must be performed by a qualified heating contractor.
Periodically	Heating Contractor		Ensure functionality of low water cut-offs, during operation, based on supplier's instructions.
			Inspect low- and/or high-pressure gas switch (if used).
			Inspect main burner flame and follow burner manufacturer's instruction manual for detailed service and maintenance guidelines. Manual is shipped with burner.
			All boilers and the boiler room must be kept free of high dust levels, high humidity, aggressive vapor and/or chemicals containing chlorine.
			Ensure proper boiler room ventilation.
			Check and repair valves, fittings and pipes.
			Combustion chamber door and flanges may need to be retightened and resealed.

IMPORTANT

Keep boiler and boiler room clear and free from combustible materials, gasoline and other flammable vapors and liquids. Do not obstruct the flow of combustion and ventilation air. All inspection, maintenance, and service must be performed by a qualified heating contractor.

IMPORTANT

The boiler should be cleaned at least once a year by a qualified heating contractor or service agency.

Additional Maintenance Information

Danger of freezing

If the system is subject to freezing temperatures and is not filled with antifreeze for protection, the system including the boiler must be drained of water. The valve before automatic feed valve (if installed) must be closed. All other valves, air vents and drain valves must remain open.

Long periods of shut-down

In case the heating boiler is shut down for an extended period of time, i.e. after the heating season, the combustion chamber, the flue gas collector and the vent pipe should be properly cleaned to avoid corrosion. The heating system can stay filled and under pressure. The remaining condensate should be removed from the flue gas collector by means of the front inspection service opening.

Water quality

The lifetime of the entire heating system is influenced by the water quality. A water treatment system will protect against damages caused by corrosion and lime formation. Hard water conditions (i.e. calcium carbonate) must be avoided as it will cause deposits to accumulate on the heat exchanger surfaces.

If in any doubt about the water quality, please have a proper water analysis done. Check with regional chemical suppliers for boiler water treatment or with Viessmann Manufacturing Company Inc. directly.

Quick Reference

°C	°F
-40	-40
-35	-31
-25	-13
-20	-4
-18	0
-16	+3
-14	+7
-12	+10
-10	+14
-9	+16
-8	+18
-7	+19
-6	+21
-5	+23
-4	+25
-3	+27
-2	+28
-1	+30
0	+32
+1	+34
+2	+36
+3	+37
+4	+39
+5	+41
+6	+43
+7	+45
+8	+46
+9	+48
+10	+50
+12	+54
+14	+57
+16	+61
+18	+64
+20	+68
+25	+77
+30	+86
+35	+95
+40	+104
+50	+122
+60	+140
+70	+158
+80	+176
+90	+194
+100	+212
+110	+230

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